

JPRS 75402

28 March 1980

USSR Report

LIFE SCIENCES

AGROTECHNOLOGY AND FOOD RESOURCES

No. 1



FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

REPORT DOCUMENTATION PAGE		1. REPORT NO. JPRS 75402	2.	3. Recipient's Accession No.
4. Title and Subtitle USSR REPORT: LIFE SCIENCES AGROTECHNOLOGY AND FOOD RESOURCES, No. 1			5. Report Date 28 March 1980	
7. Author(s)			6.	
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			8. Performing Organization Rept. No.	
12. Sponsoring Organization Name and Address: As above			10. Project/Task/Work Unit No.	
			11. Contract(C) or Grant(G) No. (C) (G)	
13. Type of Report & Period Covered			14.	
15. Supplementary Notes				
16. Abstract (Limit: 200 words) This serial report contains articles, abstracts and news items on agrotechnology, environmental degradation, food resources, industrial microbiology, plant pathology, soil technology, veterinary science, and policy and administration.				
17. Document Analysis a. Descriptors USSR Agrotechnology Food Resources Industrial Microbiology Pharmaceutical Industry				
b. Identifiers/Open Ended Terms				
c. COSATI Field/Group 02, 6A, 6C, 6F, 6H, 6O				
18. Availability Statement Unlimited Availability Sold by NTIS Springfield, Virginia 22161		19. Security Class (This Report) UNCLASSIFIED		21. No. of Pages 27
		20. Security Class (This Page) UNCLASSIFIED		22. Price

USSR REPORT
LIFE SCIENCES
AGROTECHNOLOGY AND FOOD RESOURCES

No. 1

CONTENTS

PAGE

AGROTECHNOLOGY

All-Union Conference 'Problems of the Selectivity and Mechanism of Action of Organophosphoric Insecticide-Acaricides' (N.I. Aronova, V.A. Dubovitskiy; IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA, No 1, 1980).....	1
Implementation of Scientific Advancements in Agriculture.....	9
Scientists Working for a Million Tons of Kuban Rice.....	9

BIOCHEMISTRY

Structure and Properties of Food Allergens.....	10
---	----

BIOPHYSICS

Analysis of the Effect of a Constant Magnetic Field on Refrigeration of Meat Products.....	11
Differences in the Electric Potentials of Germinating and Nongerminating Corn Seeds as an Indicator of Viability.....	12

CONTENTS (Continued)	Page
INDUSTRIAL MICROBIOLOGY	
Biomass Compositior of Activated Sludge From Meat-Packing Plant Purification Installations.....	13
INSTRUMENTS AND EQUIPMENT	
New Semiautomatic IP-1 Injector.....	14
MICROBIOLOGY	
Interaction of FMD Virus With Cells of Different, Chronically- Infected Animals.....	15
Isolation of Influenza Virus From Reindeer.....	15
New Variant of Fowl Influenza Virus.....	16
Genetic Aspects of Chicken Resistance to Disease.....	16
PHARMACOLOGY	
Assay of Estrogenic Mycotoxins in Concentrated Livestock Feed..	17
PLANT BIOCHEMISTRY	
Biological Aspects of Protecting Potatoes, Vegetables and Fruits Against Storage Losses.....	18
Current Status and Perspectives for Biological Plant Protection in the USSR.....	18
Potential Plant Productivity and Principles of its Maximum Utilization.....	19
Basic Trends in Legume Breeding.....	19
Microbiologic Factors in Pesticide Deroxification: A Literature Review.....	20
Physiologic and Genetic Aspects of Improved Crop Yields.....	20
Effects of the Dwarfing Gene 'DW' on the Growth Rate of Egg Laying Hens During the Pre-Laying Period.....	21

CONTENTS (Continued)

Page

PLANT PATHOLOGY

Effect of Gamma-Aminobutyric Acid, Lithium Salts Thereof and Sodium Hydroxybutyrate on Symptomatology of Experimental Anticholinesterase Poisoning.....	22
Plant Metabolism of Herbicides as a Factor in Selective Toxicity: A Literature Review.....	22
Prediction of Possible Losses in Winter Wheat Harvest Due to Yellow Rust.....	23
Ascorbic Acid as a Factor in the Resistance of Winter Wheat to Brown Leaf Rust (Histochemical Studies).....	23
Chemical 'Immunization' of Wheat With Fungicides and its Effects on Concentration and Function of Plant Nucleic Acids.....	24

UDC 633/635:008

IMPLEMENTATION OF SCIENTIFIC ADVANCEMENTS IN AGRICULTURE

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 801-805

MUROMTSEV, G.S., All-Union Scientific Research Institute of Applied Molecular
Biology and Genetics, Moscow

[Abstract] A rationale is presented for the greater implementation of the latest advancements of molecular biology and genetics in plant and animal husbandry at the Soviet state and collective farms. While the ideological climate is such that great progress is being made along these lines, even greater success can be assured by closer cooperation between the research establishments and farm managers and an open attitude toward new discoveries.
[564-12172]

UDC 633.18:631.5

SCIENTISTS WORKING FOR A MILLION TONS OF KUBAN RICE

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 6, 1979 pp 806-810
manuscript received 16 Oct 78

ALESHIN, YE. P. and GRIGOR'YAN, A.G., All-Union Scientific Research Institute of Rice, Krasnodar

[Abstract] A summary is presented of the research being undertaken at the All-Union Scientific Research Institute of Rice in Krasnodar in order to assure the production of 1 million tons of rice in the Kuban in the not too distant future. References 8 Russian.
[564-12172]

BIOCHEMISTRY

UDC [616-056.43-02:613.2]-074

STRUCTURE AND PROPERTIES OF FOOD ALLERGENS

Moscow VOPROSY PITANIYA in Russian No 1, Jan-Feb 80 pp 3-10 manuscript received 5 Feb 79

SHATERNIKOV, V.A., KONYSHEV, V.A. and MAZO, V.K., Institute of Nutrition, USSR Academy of Medical Sciences, Moscow

[Abstract] A survey is made of alimentary allergy, which is a widespread disease (10-15 percent incidence in children and 2-3 percent in adults), including allergy to milk proteins, cod, eggs, oil-containing plants, grains, tomatoes, coffee beans, i.e., in most cases foods referable to simple proteins or glycoproteins. Various biochemical studies are cited, suggesting that a carbohydrate component may be involved in occurrence of hypersensitivity or enhancement thereof. References 76: 7 Russian, 69 Western. [563-10657]

BIOPHYSICS

UDC [621.57-9:637.5]:621.3.013.004.15

ANALYSIS OF THE EFFECT OF A CONSTANT MAGNETIC FIELD ON REFRIGERATION OF MEAT PRODUCTS

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 12, 1979 pp 35-37

YEFIMOV, A.V., MALOVA, N.D., candidate of technical sciences (CTS), and ROSLOVA, A.P., CTS, Moscow Technological Institute of the Meat and Milk Industry

[Abstract] The effect of a constant magnetic field [CMF] on freezing of meat was studied in a specially designed unit, a heat-insulated chamber constructed of brass, stainless steel and textolite, with a temperature range from 40 to -50°C , an air-flow range of 0.5-6 m/sec, a magnetic field of $0-2 \cdot 10^5$ A/m in intensity and a $\pm 0.1^{\circ}\text{C}$ uniformity. Dry ice was the refrigerant. The meat sample was fresh beef, quality grade 1, without fat, connective tissue or large blood vessels. Freezing the meat in a magnetic field made it possible to control heat diffusion within it. Less energy was lost during intensification of freezing of meat in the magnetic field. The increase in power was related only to the acceleration of energy removal; the amount of energy used to create the magnetic field was insignificant. The magnetic field had an insignificant effect on cooling of meat containing water in a droplet state, but intensified crystallization and cooling of meat containing water in a crystalline state. Cryoscopic temperature dropped $0.3-0.5^{\circ}\text{C}$ during freezing of meat in a magnetic field with an intensity of $0.6 \cdot 10^5$ A/m or higher. Optimal magnetic field intensity was $0.4-0.8 \cdot 10^5$ A/m. The intensifying effect of the CMF on thawing appeared only during heating of the frozen product and melting of ice. The weight losses of meat frozen in a CMF decreased by 30 percent during freezing and by 50 percent during thawing, in comparison with freezing without a CMF. Losses of components with meat juice during thawing decreased from 53 to 23 percent. Figures 3; references 10: 8 Russian, 2 Western.
[555-9307]

DIFFERENCES IN THE ELECTRIC POTENTIALS OF GERMINATING AND NONGERMINATING
CORN SEEDS AS AN INDICATOR OF VIABILITY

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 791-792 manuscript received 4 Aug 78

RUBTSOVA, M.S., Agricultural Institute, Gor'kiy

[Abstract] Electrophysiologic studies were conducted on hybrid corn seeds (VIR 44 X VIR 40) to determine whether electric potentials (EP) can be utilized as an indication of viability. Experiments with viable, nonviable, and heat (105°C) killed seeds provided data that such determinations can be used to evaluate seed viability. Immediately prior to germination the viable seeds showed that the EP between the seed bud and the endosperm, and between the embryo root and the budlet, falls sharply and assumes a negative value. Germination sets in following an increase in the EP. Similar phenomena were also noted on removal of the seeds from water. The nonviable and heat killed seeds did not present with a decrease in the EP on attempts at inducing germination. Figures 1; references 5 Russian.
[564-12172]

UDC [628.312:54]:637.513.3

BIOMASS COMPOSITION OF ACTIVATED SLUDGE FROM MEAT-PACKING PLANT PURIFICATION INSTALLATIONS

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 12, 1979 pp 33-34

SALYUK, A.I., doctor of technical sciences, NIKITIN, G.A., professor, and LEVITINA, N.V., Kiev Technological Institute of the Food Industry

[Abstract] The amino acid and vitamin composition of the biomass of activated sludge formed during the anaerobic - aerobic treatment of waste waters from the Chortkovskii meat-packing plant was analyzed for its possible value as a fodder additive. The biomass contained (in percent of absolute dry matter) 48-59 percent crude protein, 44-56 percent protein, 4.3-7.8 percent fat, 6.0-34 percent cell tissue and 12-24 percent ash. The ash contained major and other trace elements. A kg of dry biomass contained 280 g of amino acids with essential amino acids comprising more than 30 percent of the total. Glutamic and aspartic acids, alanine and cysteine levels were particularly high. Activated sludge exceeded fodder yeast, a protein-vitamin complex and tankage in its methionine, proline and cysteine content. The amino acid content was reduced to 41 percent of its initial level after a 30-day fermentation. However, a 3-4 day anaerobic treatment is feasible, since it did not affect the amino acid total: the quantity of cysteine and arginine decreased, but that of leucine and tyrosine increased. Fermentation partially inactivated pathogenic microflora and reduced their count 100-fold; it improved biomass dehydration and increased the content of group B vitamins, particularly of B₁₂. One g of dry biomass contained 3 μ g B₁, 25 μ g B₂, 90 μ g B₅, 0.7 μ g B₆, 0.2 μ g B₇ and 45 μ g B₁₂. The dehydrated and dried product may be used in the production of protein-vitamin fodder additives. A meat-packing plant can realize a profit of 572,000 rubles/year at a 100-ton production capacity. References 7: 6 Russian, 1 Western.
[555-9307]

INSTRUMENTS AND EQUIPMENT

UDC 619:615.47

NEW SEMIAUTOMATIC IP-1 INJECTOR

Moscow VETERNARIYA in Russian No 9, Sep 79 pp 38-39

MIRONOV, A.I., and KOZHEMYAKA, N.V., USSR Poultry Industry

[Abstract] A new semiautomatic IP-1 injector was developed in 1977-1978 for mass scale inoculation of day-old chicks against Marek's disease.

A breakdown is given of savings realized with the use of this injector, and its design is illustrated in a figure showing all components, which are also described in the text. Figures 1.

[547-10657]

MICROBIOLOGY

UDC 619:576.858.4:576.809.33:576.8.097.23

INTERACTION OF FMD VIRUS WITH CELLS OF DIFFERENT, CHRONICALLY-INFECTED ANIMALS

Moscow VETERINARIYA in Russian No 9, Sep 79 pp 26-29

SALAZHOV, YE.L., and LEBEDEV, A.I.

[Abstract] Experiments were conducted to develop a model of latent and chronic FMD [foot-and-mouth disease] in a cell population, to determine the mechanisms of persistence of FMD virus and make a comprehensive study of the role and share of different factors involved in biological equilibrium between the cell and virus, since it is difficult to pursue such studies in the intact body. Types A and C FMD virus were used to infect cultures of transferable renal cells of sheep, calves, swine embryos, piglets, as well as trypsinized cultures of pig embryo and cow embryo kidneys. A detailed description is given of doses and conditions under which the cultures were infected. Demonstration of the feasibility of modeling viral persistence on the cellular level is very promising to theory and practice, as it permits studies of viral carriers, insusceptibility of animals and possible natural sources of infection; the technique can also be used for experimental alteration of antigenic structure of viruses. [547-10657]

UDC 619:576.858.75:576.809.31:636.29

ISOLATION OF INFLUENZA VIRUS FROM REINDEER

Moscow VETERINARIYA in Russian No 9, Sep 79 p 32

PYSINA, T.V., L'VOV, D.K., BRAUDE, N.A., SOROCHENKO, V.A., PODCHERNYAYEVA, R.YA., MYASNIKOVA, I.A., and KLIMENKO, S.M.

[Abstract] Type A influenza virus was isolated from reindeer in Chukotskiy National Okrug in 1977. Tests on 9-10 day chick embryos (hemagglutination inhibition reaction, morphological and typing) revealed the virus to be

referable to the 6th avian type (Hav6) with regard to hemagglutinin and 2d type of human Asian influenza virus according to neuraminidase. The virus isolated from reindeer, labeled as A/reindeer/Chukotka/1254/77, differs from its antigenic analogue, A/turkey/Massachusetts/65. Figures 1. [547-10657]

UDC 619:576.858.73

NEW VARIANT OF FOWL INFLUENZA VIRUS

Moscow VETERINARIYA in Russian No 9, 1979 pp 29-31

OSIDZE, N.G., L'VOV, D.K., SYURIN, V.N., SMORZHEVSKAYA, L.S., LENCHENKO, YE. V., RADCHUK, L.A., BRAUDE, N.A., MYASHIKOVA, I.A., PODCHERNYAYEVA, R. YA., KIR'YANOVA, A.I., and SHAYKHANOVA, Z.T.

[Abstract] Diagnostic studies were made of chickens at two poultry industrial farms where there had been an epizootic outbreak of influenza early in 1977, the clinical signs of which differed from those induced by influenza virus serotype 6. Viruses were isolated from the brain and spleen of sick hens, then cultures on chick embryos for identification. The serological tests used are described in detail. A new, previously unknown serological variant of fowl influenza virus was isolated and designated as GP7N1, containing avian hemagglutinin 7 and neuraminidase 1, which is inherent in human influenza virus. There was confirmation of the opinion that the latter is transmitted to fowl that may constitute a reservoir for producing new variants of influenza virus. Figures 1. [547-10657]

UDC [619:616.9-097]:636/52/.58

GENETIC ASPECTS OF CHICKEN RESISTANCE TO DISEASE

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79 pp 741-744 manuscript received 26 Mar 79

MOISEYEVA, I.G., TOLOKONNIKOVA, YE.V., KLEYEBERG, K.V., SEREBRYAKOV, A.S., MELEK, O.I., BESSARABOV, B.F., and LAZBERG, L.K., Institute of General Genetics, USSR Academy of Sciences, Moscow

[Abstract] Various breeds of chickens were investigated for the relationship between genetic polymorphism (ovalbumin, globulins, egg proteins, serum albumin) and resistance to a Newcastle disease vaccine virus, Salmonella pullorum, Escherichia coli, and Mycoplasma gallisepticum infections. The results showed that the markers under study could not be used to follow hereditary resistance to the infections in question in view of the poor correlation between a given marker and susceptibility to a given agent. References 9: 2 Czech, 2 Western, 5 Russian. [564-12172]

PHARMACOLOGY

UDC 619:614.9:616.992.28-084:636.08/.086

ASSAY OF ESTROGENIC MYCOTOXINS IN CONCENTRATED LIVESTOCK FEED

Moscow VETERINARIYA in Russian No 9, Sep 79 pp 23-25

YAKUB, G.G., Experimental Livestock Station, Kishinev Agricultural Institute

[Abstract] Toxicity of maize grain stricken with *Fusarium* fungi was studied in tests on adult rats, white mice and rabbits, as well as paramecia, and failed to demonstrate estrogenic mycotoxins. Tests were then conducted on young rats, in whom it was possible to determine the coefficient of estrogenism as a function of mycotoxin content and duration of intake of contaminated feed. These studies were conducted because excessive intake of contaminated feed causes development of vulvovaginitis, enlargement of the vulva and mammary glands, with occasional prolapse of the vagina and rectum of swine. The method used in testing baby rats was tried on pigs fed contaminated grain and found to be effective for demonstration of estrogenic mycotoxins.

[547-10657]

PLANT BIOCHEMISTRY

UDC 632

BIOLOGICAL ASPECTS OF PROTECTING POTATOES, VEGETABLES AND FRUITS AGAINST STORAGE LOSSES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 1, Jan-Feb 80 pp 73-93 manuscript received 11 Aug 79

METLITSKIY, L.V., Institute of Biochemistry imeni A.N. Bakh, USSR Academy of Sciences, Moscow

[Abstract] This is a review discussion of the various factors which cause high storage losses of potatoes, vegetables and fruits, attention is given to studies of the biochemical mechanisms which regulate the resistance of plant tissues to phytopathogenic microorganisms, the resting state and transition to active growth, maturation and aging and methods of controlling these mechanisms to protect crops against infectious diseases and functional disorders, premature sprouting and overripening. Combination methods such as active ventilation, artificial cooling, a regulated gas medium, physiologically active substances, ionization radiation and other methods are effective in prevention of storage losses. References 41: 33 Russian, 8 Western.

[561-unknown]

UDC 632.937.1

CURRENT STATUS AND PERSPECTIVES FOR BIOLOGICAL PLANT PROTECTION IN THE USSR

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79 pp 675-682 manuscript received 15 Dec 78

BONDARENKO, N.V., VORONIN, K. YE., and GRINBERG, SH. M., Leningrad Agricultural Institute; All-Union Scientific Research Institute (AUSRI) of Biological Methods of Plant Protection, Kishinev; AUSRI of Plant Protection, Leningrad

[Abstract] The current status and perspective for biological crop protection in the USSR are reviewed in light of the July 1978 Plenum of the CC of the CPSU on "Further Development of Agriculture in the USSR." At the present time 35 research establishments are engaged in research on

biological plant protection and the creation of new entomophages, under overall coordination of the All-Union Scientific Research Institute of Biological Methods of Plant Protection. An indication of success in this area is provided by the fact that in 1960 only 200 thousand hectares were protected by biological methods, and in 1977 that figure had increased to 13.7 million hectares. Equally important advances have been made in biological weed control, and future plans call for even greater utilization of natural host-parasite relationships in crop management and protection. References 40: Russian.
[564-12172]

UDC 631.59"313"+581.132

POTENTIAL PLANT PRODUCTIVITY AND PRINCIPLES OF ITS MAXIMUM UTILIZATION

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 683-694 manuscript received 15 Aug 79

NICHIPOROVICH, A.A., Institute of Plant Physiology imeni K.A. Timiryazev, USSR Academy of Sciences, Moscow [The author Anatoliy Aleksandrovich, organized research on intensive cultivation of algae and higher plants under controlled conditions in connection with problems pertaining to closed life support systems for cosmonauts and the exploration of outer space]

[Abstract] Consideration is provided to the role of photosynthesis in determining plant productivity as an inseparable component of complex physiologic interactions involving growth processes, assimilation of nutrients, organogenesis, and availability of optimum solar radiation. Theoretical conclusions and practical experience have demonstrated that adaptability of the photosynthetic apparatus to various environmental factors is the key mechanism determining crop productivity since the products of photosynthesis act as regulators of growth and organogenesis. Figures 7; references 18: 1 Western, 17 Russian.
[564-12172]

UDC 633.31/.37:631.52

BASIC TRENDS IN LEGUME BREEDING

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 695-704 manuscript received 15 Feb 79

CHEKALIN, N.M., All-Union Scientific Research Institute of Legume and Grain Crops, Orel

[Abstract] A survey of current trends in legume crop breeding has shown that one of the most promising approaches consists of utilization of transgressive breeding to increase the crop yields. Success rests on selection

of the proper parental forms for hybridization based on their combining ability. By using such an approach it has been possible to obtain leguminous crops (peas, lupin, vetch, beans, soya beans, garbanzo, etc.) with improvements in high quality proteins, disease resistance, drought resistance, increased seed shatter resistance, etc. References 26: 11 Western, 15 Russian.

[564-12172]

UDC 502.61.7

MICROBIOLOGIC FACTORS IN PESTICIDE DETOXIFICATION: A LITERATURE REVIEW

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 710-715 manuscript received 12 Dec 78

KRUGLOV, YU.V., All-Union Scientific Research Institute of Agricultural Microbiology, Leningrad

[Abstract] A survey of the factors responsible for biodegradation of pesticides and, hence, their detoxification, has revealed the following soil microorganisms to be of prime importance: *Pseudomonas*, *Arthrobacter*, *Flavobacterium*, *Brevibacterium*, *Mycobacterium*, *Nocardia*, *Aspergillus*, *Fusarium*, and *Penicillium*. Evaluation of the biochemical mechanisms has demonstrated the key importance of oxidation, with the recommendation the detoxification be enhanced by soil inoculation with the appropriate microbes, utilization of agricultural practices that facilitate growth of such soil microorganisms, and enrichment of the soil with pertinent enzyme and cosubstrate preparations. Figures 5; references 32: 15 Russian, 17 Western.

[564-12172]

UDC 631.559.2+581.132

PHYSIOLOGIC AND GENETIC ASPECTS OF IMPROVED CROP YIELDS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 762-766 manuscript received 21 Jun 79

NASYROV, YU.S., Institute of Plant Physiology and Biophysics, Tadjik SSR, Academy of Sciences, Dushanbe

[Abstract] A review is provided of experience with cotton plants in establishing the physiologic and genetic aspects of plant productivity. It has been postulated and substantiated experimentally that, essentially, photosynthesis is under the control of nuclear and plastid genes and subject to the fine interaction between them. Consequently, while it appears possible to employ standard techniques of genetic engineering in attempting to

regulate photosynthesis, a more profitable approach might be to employ experimental mutagenesis to modify inducible phosphoenolpyruvate isozymes in order to enhance CO₂ transport to the chloroplasts and, thus, to increase photosynthetic efficiency. Figures 5; references 12: 5 Russian, 7 Western. [564-12172]

UDC 636.52/.58.082.12

EFFECTS OF THE DWARFING GENE 'DW' ON THE GROWTH RATE OF EGG LAYING HENS
DURING THE PRE-LAYING PERIOD

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 798-800 manuscript received 9 Mar 78

KOROLEVA, E.A., ZLOCHEVSKAYA, K.V., ZHURAVLEV, I.V., and ZIMNIKOVA, T.A.,
All-Union Scientific Research and Technical Institute of Poultry Breeding,
Zagorsk, Moscow Oblast

[Abstract] Comparative observations on hens with the dwarfing gene (dw-) and their sibs without it (Dw-) showed that the pre-laying period in the former was about 3 days longer than in the latter. The rate of growth, weight gain, and protein-bound phosphorus in the dw- hens decrease during the pre-laying period, while the rate of growth prior to the pre-laying period was approximately equivalent for these two groups of hens. During the 2 week period following the laying of the first egg the dw- hens lost ca. nine percent of their body weight and presented with adrenal hypertrophy. During that period the weight of the Dw- sibs did not change while the adrenal glands decreased in size. Such physiological differences should provide a basis for a more rational utilization of the dw- hens. Figures 2; references 4: Western. [564-12172]

PLANT PATHOLOGY

UDC 615.9-08:661.718.1

EFFECT OF GAMMA-AMINOBUTYRIC ACID, LITHIUM SALTS THEREOF AND SODIUM HYDROXY-BUTYRATE ON SYMPTOMATOLOGY OF EXPERIMENTAL ANTICHOLINESTERASE POISONING

Kishinev ZDRAVOOKHRANENIYE in Russian No 4, Jul-Aug 79 pp 23-24 manuscript received 21 Oct 78

ZVEREV, M.I., MATKOVSKIY, K.L., SHTYRBUL, G. YE., and RUSSU, A.G., Kishinev Medical Institute (rector: Prof V. Kh. Anestiadi, academician of the Moldavian Academy of Sciences)

[Abstract] GABA [gamma-aminobutyric acid], sodium hydroxybutyrate and lithium salts of GABA were tested as antidotes on albino rats, to the anticholinesterase action of widely used organophosphorus compounds (OPC). These OPC, which disrupt acetylcholine metabolism, are used as insecticides, acaricides, fungicides, herbicides, defoliants, etc., and are highly toxic to man, and even lethal in some cases. GABA given 30 minutes prior to (not-identified) OPC administration, and lithium salt of GABA given after development of tonic-clonic seizures, were effective in increasing animal survival rate.

[548-10657]

UDC 632.954+581.13

PLANT METABOLISM OF HERBICIDES AS A FACTOR IN SELECTIVE TOXICITY: A LITERATURE REVIEW

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79 pp 705-709 manuscript received 19 Mar 79

CHKANIKOV, D.I., All-Union Scientific Research Institute of Phytopathology, B. Vyazemy, Moscow Oblast

[Abstract] Investigations, conducted to establish the metabolic determinants of the selective toxicity of herbicides, have demonstrated that the degree to which herbicides are metabolically inactivated or modified determines their effectiveness. Studies with the widely employed herbicides atarine, 2,4-D, monuron, and propanyl have revealed a sequence of reaction mechanisms that fall into three broad categories: a)oxidation, reduction,

hydroxylation, dehalogenization, dealkylation, and so forth; b) conjugation with endogenous carbohydrates (usually glucose) or amino acids; and c) polymerization or some other process leading to the formation of an insoluble product. The more effective a given plant is in metabolizing a herbicide, the less likely it is to be adversely affected by the herbicide. Figures 4; references 16: 4 Russian, 12 Western.
[564-12172]

UDC 633.11"324":[632.4+631.559"314"]

PREDICTION OF POSSIBLE LOSSES IN WINTER WHEAT HARVEST DUE TO YELLOW RUST

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 782-787 manuscript received 12 Dec 77

TEREKHOV, V.I., KAYDASH, A.S., BESSMEL'TSEV, V.I., SOLODUKHINA, L.D., and KOLESNIKOVA, V.I., North Caucasian Scientific Research Institute of Phytopathology, Krasnodar

[Abstract] A mathematical analysis of factors contributing to the spread of yellow rust and resultant crop losses has shown that the most important factor in European USSR favoring yellow rust is the level of precipitation. For purposes of predicting crop losses due to yellow rust a nomogram was constructed which yielded ca. 70 percent coincidence with actual losses. Figure 3; references 9: Russian.
[564-12172]

UDC 633.11"324":632.452

ASCORBIC ACID AS A FACTOR IN THE RESISTANCE OF WINTER WHEAT TO BROWN LEAF RUST (HISTOCHEMICAL STUDIES)

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79
pp 794-795 manuscript received 28 Dec 77

LOBAN', V.L., Ukrainian Agricultural Academy, Kiev

[Abstract] Histochemical studies were conducted during the 1975-1977 period on susceptible (Mironovskaya 808, Il'ichevka) and resistant (No 208/8-8, No 208/8-11) winter wheat varieties infected with race 77 of the brown wheat rust agent (*Puccinia triticina*) to determine the fate of ascorbic acid at the site of lesion. The results showed that, at the start of the infection, levels of reduced ascorbic acid were increased to a much greater extent in the resistant plants than in the susceptible varieties. With progression--at the stage of fungal sporulation--levels of reduced ascorbic acid fell and eventually became undetectable in the susceptible plants. In the resistant plants both reduced and oxidized ascorbic acid continued to accumulate and the reduced form was also observed in various

fungal structures. The appearance of oxidized vitamin C at the site of lesion and in adjacent areas was interpreted to indicate greater inactivation of fungal toxin(s). References 5: 1 Ukrainian, 4 Russian.
[564-12172]

UDC 633.11:581.19:632.952

CHEMICAL 'IMMUNIZATION' OF WHEAT WITH FUNGICIDES AND ITS EFFECTS ON CONCENTRATION AND FUNCTION OF PLANT NUCLEIC ACIDS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 14 No 6, Nov-Dec 79 pp 796-798 manuscript received 18 Oct 77

TYUTEREV, S.L., KHALEZOVA, L.A., and FEDOROVA, F.A., All-Union Scientific Research Institute of Plant Protection, Leningrad

[Abstract] Studies were conducted on the effects of various chemical "immunizing" agents on nucleic acid metabolism of Amurskaya 74 wheat. The results showed that treatment of the seeds with certain fungicides (plant-vaks, indar, benomil/anilat mixture, and preparations 1822 and 1823) led to earlier aging of the plant leaves and depressed levels of RNA. These findings indicate that the effects of fungicide treatment of the seeds on the plants can be evaluated from the depressed RNA/DNA ratios.

References 7: Russian.

[564-12172]

END

SELECTIVE LIST OF JPRS SERIAL REPORTS

USSR SERIAL REPORTS (GENERAL)

USSR REPORT: Agriculture
USSR REPORT: Economic Affairs
USSR REPORT: Construction and Equipment
USSR REPORT: Military Affairs
USSR REPORT: Political and Sociological Affairs
USSR REPORT: Energy
USSR REPORT: International Economic Relations
USSR REPORT: Consumer Goods and Domestic Trade
USSR REPORT: Human Resources
USSR REPORT: Transportation
USSR REPORT: Translations from KOMMUNIST*
USSR REPORT: PROBLEMS OF THE FAR EAST*
USSR REPORT: SOCIOLOGICAL STUDIES*
USSR REPORT: USA: ECONOMICS, POLITICS, IDEOLOGY*

USSR SERIAL REPORTS (SCIENTIFIC AND TECHNICAL)

USSR REPORT: Life Sciences: Biomedical and Behavioral Sciences
USSR REPORT: Life Sciences: Effects of Nonionizing Electromagnetic Radiation
USSR REPORT: Life Sciences: Agrotechnology and Food Resources
USSR REPORT: Chemistry
USSR REPORT: Cybernetics, Computers and Automation Technology
USSR REPORT: Electronics and Electrical Engineering
USSR REPORT: Engineering and Equipment
USSR REPORT: Earth Sciences
USSR REPORT: Space
USSR REPORT: Materials Science and Metallurgy
USSR REPORT: Physics and Mathematics
USSR REPORT: SPACE BIOLOGY AND AEROSPACE MEDICINE*

WORLDWIDE SERIAL REPORTS

WORLDWIDE REPORT: Environmental Quality
WORLDWIDE REPORT: Epidemiology
WORLDWIDE REPORT: Law of the Sea
WORLDWIDE REPORT: Nuclear Development and Proliferation
WORLDWIDE REPORT: Telecommunications Policy, Research and Development

*Cover-to-cover

JPRS 75568

25 April 1980

USSR Report

LIFE SCIENCES

AGROTECHNOLOGY AND FOOD RESOURCES

No. 2



FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

25 April 1980

USSR REPORT
LIFE SCIENCES
AGROTECHNOLOGY AND FOOD RESOURCES

No. 2

CONTENTS

AGROTECHNOLOGY	1
Phosphate Deposit Discovered in Yakutiya (A. Kucher; LENINGRADSKAYA PRAVDA, 5 Feb 80)	1
Effect of Magnesium on Harvest Yield and Quality of Hay	4
Comparative Effectiveness of Red Phosphorus and Superphosphate	4
Influence of Awns on Productivity of Winter Wheat Spikes Under Conditions of the Central Povolzh'ye	5
Kazakhstanskaya 200 and Lanka [New High-Yield Soybean Varieties]	6
Gibridnaya 670 [New High-Yield Soybean Variety]	6
Rannyaya 10 [New High-Yield Soybean Variety]	7
High Yield Varieties of Spring Wheat	8
ECOLOGY	9
Water Consumption by Spring Wheat Under Varying Weather Conditions ...	9
MICROBIOLOGY	10
Possibility of Transmission of Antigenic Properties of E. Coli During Conjugation	10
PHARMACOLOGY	11
Some Features of Chicken Blood Cholinesterase	11
Phagocyte Activity and Alkaline Phosphatase in Animals Poisoned By Pesticides	11
Pathomorphology and Pathogenesis of Polikarbacin Poisoning of Poultry	12

CONTENTS (Continued)	Page
PLANT BIOCHEMISTRY	13
AGROTECHNOLOGY	13
Belorussian Institute Recommends Seed Disinfection (V. Samersov; SEL'SKAYA GAZETA, 17 Feb 80)	13
Haploid Production in Crossing of Hordeum Vulgare With Hordeum Bulbosum	15
Spontaneous High Lysine Mutant of Winter Barley L-76 ..	15
Use of Induced Mutants in the Breeding of Buckwheat	16
PLANT PATHOLOGY	17
Content of Organic Acids and Physiologically Active Substances in Plants With Dissimilar Sensitivities to Al^{3+} Toxicity	17
Change in Content of Carbohydrates and Nitrogenous Substances in Sorghum Plants Injured by Aphids	17
Effect of Various Forms of Nitrogen Fertilizers on the Vitality of the Cotton Wilt Causative Agent Verticillium Dahliae in the Soil	18
Methods of Breeding a New Variety of Winter Wheat Immune to Stinking Smut	19
Trends of Winter Rye Selection for Resistance to Rust	19
Method of Accelerated Evaluation of Wheat Resistance to Smut	20
Problem of Smut Resistance in Grain Crops and Means to Its Resolution	21
Activity of Protease Inhibitors and Wheat Resistance to Covered Smut	21
VETERINARY MEDICINE	23
Productivity of Basic Swine Stocks in Pure-Strain Breeding and Commercial Crossbreeding Under Conditions in the Ukraine	23
Disinfection Measures on Industrial-Type Pig Raising Farms	23

PHOSPHATE DEPOSIT DISCOVERED IN YAKUTIYA

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Feb 80 p 4

[Article by A. Kucher: "The Treasure of the Tomtor Mass"]

[Text] The geologists of the overall Arctic expedition of the Leningrad Sevmorgeo Scientific Production Association discovered a unique deposit of phosphate raw materials in North Yakutiya. It has no equal in our country at present.

The discovery took 5 years. Now, when the report on the work done has already been defended, one can and should recall how everything began.

But, first, we will try to answer the following question. Does the country now have sufficient apatite raw materials? The European part, yes. We must thank the Khibiny for this. But what about South-East Siberia? Its land, if it is generously fed with superphosphate, can yield very good harvests. Unfortunately, however, an acute shortage of raw materials for fertilizer production is felt here.

True, about 10 years ago the workers of the Scientific Research Institute of Arctic Geology together with their Krasnoyarsk colleagues discovered a few small deposits of apatite and iron ores in the north of Krasnoyarskiy Kray on the banks of the Kotuy River. Specialists now substantiate the economic advisability for the construction of a railroad from Noril'sk to this group of deposits. The point is that phosphate ores would be very welcome to the Noril'sk Mining and Metallurgical Combine, because during the production of nonferrous metals--copper, nickel and cobalt--a vast amount of sulfur is discarded into the atmosphere. According to the technology of the Nadezhdinsk Metallurgical Combine presently under construction in Noril'sk 84 percent of the sulfur dioxide will be utilized. As is well known, sulfur in combination with phosphorus yields superphosphate, which is extremely necessary for agriculture.

In the office of the Tomtor Geological Exploration Group everything is reminiscent of the last expedition, which ended in the Far North last October. Work diagrams, geological maps and geophysical plans are on walls and in files. L. L. Stepanov, chief of the group, says the following:

"Subsequently, however, it turned out that the Maymecha-Kotuy ore bearing province located on the western slope of the Anabar shield, a giant block of very ancient crystal rocks exposed in this region, is not the only one. A similar zone, within which the geologists and geophysicists of the Scientific Research Institute of Arctic Geology and the Yakutian Territorial Geological Administration detected large magnetic anomalies greatly resembling the Maymecha-Kotuy ones, was established at the end of the 1960's. According to the estimates of geophysicists, two of them are evidently due to the masses of ore bearing rocks occurring very near the earth surface. By analogy with the Maymecha-Kotuy masses, geologists assumed the presence of complex iron-phosphorus ores there. The new province was named Udzhinskaya..."

However, to assume is one thing and to discover, quite another. This task was set for the geologists and geophysicists of the Sevmorgeo Scientific Production Association. Under the agreement with their Yakutian colleagues exploration and evaluation work began in 1974.

The first group of Leningrad geologists arrived in Saskylakh by air. There is such a settlement on the Anabar River. Our geologists have a special attitude toward it--B. V. Tkachenko, a Sevmorput' geologist, subsequently director of the Scientific Research Institute of Arctic Geology, built the first house in Saskylakh in 1938.

From the settlement they set out for the south, to the exploration region. In a straight line, as the crow flies, the distance was 150 km. How much is this by foot in the tundra? They arrived. The landscape was depressing. The saplings were saplings in name only. When the earth was dug with a shovel, there was ice...

Drilling machines were set up. Within the largest of the two anomalies two wells uncovered massive iron ores.

"Here is the core sample," said Stepanov, taking a heavy ingot out of the table drawer. "It contains 70 percent of pure metal."

"Does this mean success?"

"No, simply a confirmation of the geophysicists' prediction."

A few more wells were drilled. In addition to iron, veins and individual zones enriched with apatite were uncovered...

1976. Detailed magnetic exploration work was carried out. The mass was given a Yakutian name--Tomtor. The mass was developed "in a cross"--from north to south and from west to east. In the center of a giant plate with a diameter of more than 10 km, in addition to iron ore, rocks containing high industrial concentrations of phosphorus were discovered on large areas.

Another 3 years passed. During that time L. L. Stepanov's group established that, according to the most preliminary calculations, the reserves of phosphate raw materials in the central part of the Tomtor mass exceeded the Khibiny deposit. Furthermore, the new deposit is overall--in addition to phosphate ores the mass can give man a number of rare metals.

"That's all," Stepanov put together the maps and diagrams and removed the ore samples. "Now it is up to the Yakutian geologists. They should have the last word on the subject of a specific industrial utilization of these ores."

"And you?"

"We are again going to the field."
[565-11439]

11,439
CSO: 1840

USSR

UDC 631.559:546.46

EFFECT OF MAGNESIUM ON HARVEST YIELD AND QUALITY OF HAY

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 41-42 manuscript received 10 Oct 79

ZHUCHKO, L. V., Belorussian Scientific Research Institute of Soil Science and Agrochemistry

[Abstract] This study was carried on in 1974-76 at the kolkhoz "Rodina Ya. Kolasa" in Stolbtsovskiy Rayon on a soddy-podzol soil, building up on high-clay-content sandy loam underlain from a depth of 40 cm with light sandy loam; the soil is rich in phosphorus and poor in potassium. This soil requires magnesium fertilizer. Labile Mg content is 4.4 mg/100, pH 5.2. The grasses sown are timothy and clover. It was found that use of dolomite powder fertilizer on the Mg-poor soil increased the yield of hay and improved its quality; hay levels of Ca, Mg and K were improved, nitrogen content increased; protein content of fodder was raised 12-17%. The dolomite served as a liming material as well as a source of Mg. When large doses of manures are employed the dolomite used should be increased. Figures 2; references 5 Russian.
[567-8586]

USSR

UDC 631.85:631.559

COMPARATIVE EFFECTIVENESS OF RED PHOSPHORUS AND SUPERPHOSPHATE

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 16-18 manuscript received 27 Nov 78

PAYKOVA, I. V., candidate of biological sciences and GLADKOVA, K. F., candidate of agricultural sciences, All-Union Order of Labor's Red Banner Scientific Research Institute of Feeds imeni V. R. Vil'yams

[Abstract] Noting literature reports of the value of red phosphorus as a substitute for superphosphate, the two phosphorus sources were compared under field conditions, viz., a model field experiment on a peat-podzol clayey-loam soil, moderately supplied with phosphates. A grass mixture was grown on this soil whose agrochemical properties (pH, acidity, content of aluminum, potassium and phosphorus) were assayed. Fertilizer variants--superphosphate, red phosphate, mixtures of the two and ammofos--were tested, with or without liming. Experiments were initiated in 1973, and analyses reported are for the years 1974 and 1975. Methods of fertilizing are

tabulated along with hay yields. Data indicate that the red phosphorus is a suitable fertilizer and that plants can assimilate the phosphates produced in the soil from the oxidized red phosphorus. References 4: 3 Russian, 1 Western.

[567-8586]

USSR

UDC 633.11"324":631.52(470.4)

INFLUENCE OF AWNS ON PRODUCTIVITY OF WINTER WHEAT SPIKES UNDER CONDITIONS OF THE CENTRAL POVOLZH'YE

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 10-11 manuscript received 8 Oct 79

TSAREVSKIY, YU. D., candidate of agricultural sciences, Kuybyshev Agricultural Institute

[Abstract] Fifty plants of eight variants of wheat were tested in this study which included laboratory and field trials. Awns were removed, in preliminary tests, immediately after spike formation; in the basic tests, the study was made on isogenic lines. The removal of awns did lower spike productivity with respect to grains. On the isogenic lines, the effect differed as a function of the awning characteristic. Tabulated results did not indicate any preeminence of bearded forms with respect to yield of grain. As compared to the beardless forms, the bearded forms usually had a smaller number of spikes and grains in the spikes and lower productivity. Need for further study of this subject is suggested. References 10: 7 Russian, 3 Western. [567-8586]

USSR

UDC 633.34:631.526.32

KAZAKHSTANSKAYA 200 AND LANKA [NEW HIGH-YIELD SOYBEAN VARIETIES]

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 p 27

PRIKAZCHIKOVA, I. N., inspector-agronomist, Inspectorate of the State Commission of the Kazakh SSR

[Abstract] Soybean variety Kazakhstanskaya 200 was bred by the Kazakh Scientific Research Institute by means of the individual selection method, from a sample at the Kuban Experiment Station of the All-Union Scientific Research Institute of Plant Growing. The variety was adapted in Chirkentskaya and Alma-Atinskaya Oblasts in 1978. The plants grew to a height of 115-197 cm, were well foliated, were resistant to pests and disease, and were not subject to lodging. The variety was late in maturing (with a growing season of 160 days) although, in conditions of Chirkentskaya Oblast, it matured in 123-132 days. In Alma-Atinskaya and Dzhabul'skaya Oblasts in separate years the variety succumbed to frost, but with observation of a certain agricultural program, it received a high percentage of mature seed: to 80% in Alma-Atinskaya, and to 97% in Dzhabul'skaya Oblasts. During experimental years 1974-78, yield of seed from the Iliyskiy irrigated strain-testing plot was 21.7, and the Sayramskiy, 17.7 centners/ha. Variety Lanka was bred at the Kirovogradskaya Experiment Station by means of individual-group selection of Siberian material from two hybrids (VNIIMK 9186 x Primorskaya) x (Kubanskaya 4958 x Rekord Severniy). In 1980 it was adapted in the Taldy-Kurganskaya Oblast. Average harvest in the test plot was 24.0 centners/ha. The growing season was 134 days.
[569-12152]

USSR

UDC 633.34:631.526.32:631.51.02

GIBRIDNAYA 670 [NEW HIGH-YIELD SOYBEAN VARIETY]

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 27-28

KARYAGIN, YU. G., candidate of agricultural sciences, Kazakh Scientific Research Institute of Farming

[Abstract] Soybean variety Gibridnaya 670 was bred at the Kazakh Scientific Research Institute of Farming by means of the hybridization of Primorskaya 529 x Tokmakskaya. It was adapted since 1978 in III zone of Alma-Atinskaya Oblast with irrigation. The variety had a growing season of 125-129 days. It was heat and drought resistant, and was only slightly subject to diseases

and pests. It didn't exhibit lodging, and could be harvested by mechanical means. In field experiments (1972-1978) at Alma-Atinskiy and Druzhba Sovkhozes, results indicated that Gibrinaya 670 is genetically receptive to active races of rhizobium. With inoculation the plants increased in size, and productivity was increased. For normal development a short day is preferable. Where summer is longer, the growing season is 132-135 to 140-142 days. A high yield (60.2 centners/ha) was the result when soil was warmed to 14-16°C. This corresponds to the first or second ten day period of May. The largest leaf surface (77.5-84.8 thousand m²/ha) and harvest of plant mass (386.8 centners/ha) occurred with dense planting of 800,000 seeds/ha. The highest grain harvest and highest corresponding protein content occurred with planting 800,000 seeds/ha with strip sowing in twin rows. One of the most effective herbicides was linuron. Gibrinaya 670 plants are characterized by leaves which are dark green, narrow, shortened and arranged obliquely to the stem. Stems are short (92-97 cm).
[569-12152]

USSR

UDC 633.34:631.526.32

RANNYAYA 10 [NEW HIGH-YIELD SOYBEAN VARIETY]

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 26-27

MYAKUSHKO, YU. P., doctor of agricultural sciences, LUNIN, N. D., candidate of agricultural sciences, and KOCHEGURA, A. V., junior scientific collaborator, All-Union Scientific Research Institute of Oil-Bearing Crops

[Abstract] The authors examined new soybean variety Rannyaya 10 for productivity, early-maturation and adaptability to combine harvesting. The variety was developed at the All-Union Scientific Research Institute of Oil-Bearing Crops and adapted since 1980 in Krasnodarskiy Kray and Rostovskaya Oblast. It was bred by the method of individual selection from hybrid populations (VNIIMK 7 x Rentgenomutant No 23). The new variety was early in maturation with a growing season of 120-130 days, 17 days shorter than the standard Komsomolka. Rannyaya 10 surpassed the standard's yield by 1.7 centners/ha, surpassed seed protein content by 1.7%, and surpassed yield of protein and oil per hectare by 110 kg. The characteristic features of Rannyaya 10 were compactness of plant, resistance to lodging, and simultaneous maturation, which allowed for combine harvesting. There was little vulnerability to pests and diseases. In the Northern Caucasus, Rannyaya 10 may be harvested at the end of August or beginning of September; along the Kuban', it matures at the end of May or beginning of June. In Central Asia,

it ripens in after harvest plantings and gives a harvest of 25-32 centners/ha. With irrigation the variety gives increased yields; it appears to do well in irrigated or nonirrigated conditions.
[569-12152]

USSR

UDC 633.11.<<321>>:631.526.32

HIGH YIELD VARIETIES OF SPRING WHEAT

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 22-26

UKHANOVA, O. I., Scientific Division of Grain Crops of the State Commission on Strain Testing of Agricultural Crops

[Abstract] In 1976, the CC CPSU and Council of Ministers USSR urged the development of spring wheat varieties with potential yield of 40-60 centners/ha on nonirrigated land and 55-60 centners on irrigated land. In recent years breeding centers have developed a number of new high yield varieties which are described in the text. Tselinnaya 20 was adapted since 1978 to Altayskiy Kray and Omskaya, Chelyabinskaya and Vostochno-Kazakhstanskaya Oblasts. It surpassed Saratovskaya by 1.8-6.0 centners/ha and exhibited high yields. Tselinnaya 21, adapted since 1980 in Semipalatinskaya, Tselinogradskaya and Kokchetavskaya Oblasts, produced 14.9, 23.3 and 24.7 centners/ha in 1976-78. Saratovskaya 46, adapted since 1977 in Saratovskaya, Volgogradskaya, Kuybyshevskaya, Chelyabinskaya and Voronezhskaya Oblasts, showed yields of 11.2-24.8 centners/ha. Kutulukskaya from the Kinel'skaya State Experiment Station has been recommended for cultivation in Kuybyshevskaya and Ul'yanovskaya Oblasts. In Omskaya, Kokchetavskaya, Severo-Kazakhstanskaya Oblasts and Krasnoyarskiy Kray, variety Omskaya 9 has been adapted successfully since 1979, with an average yield of 23.1-38.6 centners/ha. Mironovskaya Yarovaya, adapted since 1978 in Kiyevskaya Oblast, was taken to Bashkirskaya and Tuvinskaya Oblasts. Sibakovskaya 3 was adapted in Omskaya Oblast in 1980 and looked promising in Krasnoyarskiy Kray. In Orenburgskaya Oblast the Orenburgskaya 1 has been adapted since 1978 (yielding 19.3 centners/ha). Since 1979, Sverdlovskaya and Permskaya Oblasts have had the variety Sredneural'skaya, and in Kurganskaya Oblast, variety Shadrinskaya. Among hard spring wheat varieties, Almaz has been adapted in Omskaya and Kurganskaya Oblasts and Altayskiy Kray since 1978. Nakat has been adapted in Aktyubinskaya, Semipalatinskaya, Odesskaya and Khersonskaya Oblasts since 1975. Since 1980, in Kuybyshevskaya, Ul'yanovskaya and Chelyabinskaya Oblasts, the Bezenchukskaya 139 has been cultivated (36.1-38.9 centners/ha). Altayka has been adapted for Altayskiy Kray. In Saratovskaya and Volgogradskaya Oblasts, variety Krasnokutka 6 has been acknowledged for high quality and yield.
[569-12152]

USSR

UDC 633.11"321":581.11

WATER CONSUMPTION BY SPRING WHEAT UNDER VARYING WEATHER CONDITIONS

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 12-14 manuscript received 30 Oct 78

KALININ, N. I., candidate of agricultural sciences, All-Union Order of Lenin and Order of People's Friendship Scientific Research Institute of Plant Breeding imeni N. I. Vavilov

[Abstract] Greenhouse experiments were carried out to determine the effect of different weather conditions on actual water consumption of spring wheat. The level of average daily consumption varied, depending on the weather: with soil moisture constant, water consumption increased with temperature, and when the latter remained constant, the consumption increased with increasing humidity. This phenomenon varied somewhat, depending on the maturation stage of the plants. A number of temperature-humidity permutations was reported with corresponding water consumption by the plants at different growth periods. There is an optimal relationship between temperature and soil humidity at which water consumption is most economical. This optimal point must be determined experimentally for each case. References 2 Russian. [557-7813]

USSR

UDC 619:576.809.7:576.851.48

POSSIBILITY OF TRANSMISSION OF ANTIGENIC PROPERTIES OF E. COLI DURING CONJUGATION

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 24-26

SIDOROV, M. A. and ISKHAKOVA, T. I., All-Union Institute of Experimental Veterinary Medicine

[Abstract] Epizootic strains of E. coli were crossed with an apathogen strain K12, which served as the recipient. Five epizootic strain donors were used; these had been isolated from blood in the internal organs of calves affected with colibacteriosis. The strains possessed transmissible antibiotic-resistance and were pathogenic for white mice. The conjugation method used and the selection of the transconjugants has been described by Iskhakova (1975). The transconjugants retained the cultural and morphological properties of the recipient K12 strain. Tests on rabbits indicated that in administration to them of antigens from the transconjugants, O- and K- agglutinins against the corresponding donor strains were generated. The recipient strain could, during the conjugation, receive, from the donor strain, a plasmid which controls formation of O- and K- antigens. As a result, the transconjugants change their antigenic structure. No references, except attribution, in the text, to earlier investigators.

[568-8586]

USSR

UDC 619:557.153.4:631.51

SOME FEATURES OF CHICKEN BLOOD CHOLINESTERASE

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 55-57

ZHELTOV, V. A., All-Union Scientific Research Institute of Veterinary Entomology and Arachnology

[Abstract] This is a report of a study of the molecular spectrum of Broiler-6 chicken serum cholinesterase. The serum proteins were separated in a 6% polyacrylamide gel by vertical disc electrophoresis in a tris-glycine buffer at 4°C. Four molecular fractions with cholinesterase activity were isolated. While the significance of the various existing molecular forms of cholinesterase have not been decisively identified by clinical enzymologists, the report cites several Soviet authors (including Zheltov) to the effect that, when animals are poisoned with organophosphorus compounds, the molecular spectra of the cholinesterases have greater sensitivity to inhibitors as compared with general enzymic activity and can serve as a highly-sensitive test in toxicological experiments. The several molecular forms isolated were found to have an unstable attachment to erythrocytes. Use of propionylcholine, as contrasted to acetylcholine, gave more indicative results of the cholinesterase activity of the chicken blood. The enzyme activity was highest in the morning hours, decreasing as the day advanced. This fluctuation might be exploited to increase sensitivity of tests on anticholinesterases. Since the activity level also can vary with time of standing of test samples, assays must take into account these daily fluctuations and changes. No references.
[568-8586]

USSR

UDC 619:632.95:612.112.3

PHAGOCYTE ACTIVITY AND ALKALINE PHOSPHATASE IN ANIMALS POISONED BY PESTICIDES

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 57-58

YEVDOKIMOV, E. S., KURBANOV, E. A. and BAYRAMOV, M., Turkmen Scientific Research Institute of Animal Husbandry and Veterinary Meidicine; ORAKAYEVA, N. S., Turkmen State Medical Institute

[Abstract] Twelve cattle (6 bulls and 6 male calves), 1-1.5 yrs, were administered hexachlorocyclohexane or DDT dusts in their fodder, over a 3.5 month period. Prior to the experiment the phagocyte activity of the

leucocytes of the animals was assayed (in reference to a museum strain of the pathogenic staphylococcus 209). A statistically reliable decrease in the phagocytosis index was recorded in the experimental animals; the decrease was greater in the DDT-fed animals. Alkaline phosphatase activity in the experimental animals decreased as compared with controls. In kolkhos animals with residual amounts of chloroorganic pesticides in their body, and with clinical manifestation of nervous system disturbances, a decrease was found in the level of phagocytosis and leucocyte alkaline phosphatase. The tests run can be useful in diagnostic testing of farm animals.
[568-8586]

USSR

UDC 619:577.153.4:631.51

PATHOMORPHOLOGY AND PATHOGENESIS OF POLIKARBACIN POISONING OF POULTRY

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 54-55

YEVDOKIMOV, S. M., ZHAVORONKOV, N. I., AKULOV, A. V. and ANTSIFEROV, S. D.,
All-Union Institute of Experimental Veterinary Medicine

[Abstract] The physical and chemical properties and toxicological indices are listed of Polikarbacin (poliram, metiram, inagara 9102), a dithiocarbamic acid derivative widely used as a pesticide in agriculture. It is used to control fungus diseases of fruits and vegetables. In the absence of available reports on the effect of polikarbacin on animals, the present study of its action on poultry and the pathomorphological changes it can induce was carried out. Leghorn chickens were used; various doses of the pesticide were administered into the crop via a sound. Clinical symptoms produced are described. Polikarbacin was found to disturb the permeability of the vascular wall, depending on the condition of the argiophilic membranes and endothelium of the wall. Inflammation, dystrophic and necrobiotic processes developed in the gastrointestinal tract, the liver, kidneys, respiratory organs, spleen and brain. The extent of the pathomorphological changes were a function of the dosage and duration of action of the pesticide. No references.
[568-8586]

BELORUSSIAN INSTITUTE RECOMMENDS SEED DISINFECTION

Minsk SEL'SKAYA GAZETA in Russian 17 Feb 80 p 3

[Article by V. Samersov, director of the Belorussian Scientific Research Institute of Plant Protection, and S. Buga, head of the laboratory of phytopathology: "Use Seed Disinfection"]

[Text] The disinfection of seeds is the concluding stage in the preparation of seeds for spring sowing. The analyses of stock barley seeds for infection with loose smut performed at the laboratory of phytopathology of our institute have shown that 70 percent of them are free of infection, 30 percent contain infected seeds and only 5 percent are infected above the permissible norm.

Thermal disinfection is used in the control of loose smut. Along with it the use of 3 kg of the systemic disinfectant Vitavax per ton of seeds is successful. However, Vitavax, like thermal disinfection, is most effective against loose smut and insufficiently active against an infection with helminthosporia. Therefore, a combined application of Vitavax with TMTD is recommended. A total of 1.5 kg of Vitavax and the same amount of the TMTD preparation per ton of seeds are used. In effectiveness the combined preparation is not inferior to pure Vitavax and the cost of treatment is lowered considerably.

The use of the PS-10 disinfectant is recommended in this case. In it seeds are treated with a suspension of preparations. Its consumption is 10 liters per ton of seeds. The mixture of preparations in the ratio of 1:1 is prepared directly in the tank of the disinfecting machine.

Proceeding from the established infection of seeds with helminthosporia and taking into consideration the lowered viability of individual batches of seeds, the institute considers it advisable to utilize a lowered rate of consumption of granosan, that is, 0.75 to 1 kg per ton, for disinfection this year. If barley seeds are disinfected in advance, the recommended rate of consumption of granosan--1.5 kg per ton--is needed only in case of a high initial infection with helminthosporia (more than 70 percent).

The wheat seeds intended for sowing should also be disinfected in advance. Granosan (1.5 kg per ton) can be used for the disinfection of oat seeds and granosan (1.5 kg per ton), 80-percent TMTD (1.5 kg per ton) and 2.5-percent PCNB (2 kg per ton), for the disinfection of spring wheat seeds. In this case a high effectiveness due to disinfection is attained only with an accurate observance of technology. Therefore, its execution must be under the constant control of specialists.

No later than 2 weeks before sowing the treatment of seeds of cereal grass, clover, lucerne, lupin and vetch with TMTD preparations or fentiam (3.4 kg per ton) disinfects seeds against an infection with diseases and increases the sprouting energy and field germination of seeds. When fodder beans and peas are disinfected, the rate of consumption of fentiam is 4 to 6 kg per ton.

To determine the quality of disinfection of barley and grass seeds, it is possible to use the quick roll method modified at the laboratory of phytopathology of the Belorussian Scientific Research Institute of Plant Protection. It is noted for a simple execution, sufficient accuracy and objective evaluation of the effectiveness of disinfection, because it makes it possible to disclose the presence of a residual infection on seeds (except for types of smut) and, at the same time, to determine the effect of the preparation on their sowing qualities. An objective control over the quality of seed disinfection will make it possible to increase the technological discipline and responsibility of the people implementing this measure and to avoid cases of a negative effect from the use of disinfectants.
[566-11439]

11,439
CSO: 1840

USSR

UDC 633.16:631.523

HAPLOID PRODUCTION IN CROSSING OF HORDEUM VULGARE WITH HORDEUM BULBOSUM

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 7-10 manuscript received 27 Apr 79

LUK'YANYUK, S. F., IGNATOVA, S. A., MAKSIMOVA, V. I., candidate of biological sciences, and NAVOLOTSKIY, V. D. and SHEREMET, A. M., candidates of agricultural sciences, All-Union Order of Lenin and Order of Labor's Red Banner Selection-Genetic Institute

[Abstract] *Hordeum bulbosum* has been reported by a number of authors to be useful as a haploid producer in crossing *H. vulgare*; homozygote lines produced are valuable genetic material for use in selection. The present article describes results of tests to produce haploids of winter and spring barley from hybrids of F_1 in crossing of them with *H. bulbosum*. Maternal plants were hybrids of F_1 from crossing of promising forms in the department of barley selection (author's institute); paternal, *H. bulbosum* 2x lines. Crossing with *H. vulgare* by dusting and seed isolation employed Jensen's (1977) method. Media for growing of isolated seeds are detailed. Production success was found to be a function of the genotype of the maternal plant and of weather conditions at the time of dusting and development of the hybrid cereals. The haploid seeds vary in degree of differentiability; they must be grown in vitro to establish appropriate conditions for cultivation. Figures 3; references 11 Western.
[567-8586]

USSR

UDC 633.16:631.528

SPONTANEOUS HIGH LYSINE MUTANT OF WINTER BARLEY L-76

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 3-5 manuscript received 23 Apr 79

GARKAVYY, P. F., academician VASKhNIL, SHEREMET, A. M., candidate of agricultural sciences, NETSVETAYEV, V. P., and POMORTSEV, A. A., All-Union Order of Lenin and Order of Labor's Red Banner Selection Genetic Institute

[Abstract] An attempt was made to produce winter barley with a high content of lysine in its protein. Crossing Robur with pallidum 331/13 produced a new line, L-76, with a high lysine content, which was due to the recessive gene. The grain exhibited a flattened underdeveloped endosperm,

also controlled by a recessive gene. The levels of several of the essential amino acids, along with lysine, were higher in the L76 line than in the parent lines. The gene, or genes, responsible for the high lysine content in L-76 protein suppresses the synthesis of gordeine, which eventually leads to the change in the amino acid profile. References 3: 1 Russian, 2 Western.
[557-7813]

USSR

UDC 633.12:631.528

USE OF INDUCED MUTANTS IN THE BREEDING OF BUCKWHEAT

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 10-11 manuscript received 27 Jun 79

ALEKSEYEVA, YE. S., Kamenets-Podol'sk Agricultural Institute

[Abstract] Induced mutagenesis enlarged the polymorphism of buckwheat, making it possible to develop highly productive brands with a high content of protein, rutin and amino acids. The biological production potential of buckwheat is in the range of 100 hundred-weights per hectare. In practical terms, the yield is usually in the range of 25-30 hundred-weights per hectare. This is to some extent due to the sensitivity of buckwheat to meteorological conditions. Therefore, when selecting new brands, one year's data alone should not be used. The grains should undergo a period of adaptation. Productive material was obtained from irradiated seeds; chemical mutagenesis gave poorer results, but improved the quality of grain. Mixed mutagenesis gave excellent results. Comparative properties of a number of experimental brands were reported. One Russian reference (by Alekseyeva, et al).
[557-7813]

USSR

UDC 631.526:576.342

CONTENT OF ORGANIC ACIDS AND PHYSIOLOGICALLY ACTIVE SUBSTANCES IN PLANTS WITH DISSIMILAR SENSITIVITIES TO Al^{3+} TOXICITY

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 5-7 manuscript received 3 Sep 79

KLIMASHEVSKIY, E. L., corresponding member of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin and CHERNYSHEVA, N. F., candidate of biological sciences, Institute of Lumber and Wood imeni V. N. Sukachev, Siberian Department, USSR Academy of Sciences

[Abstract] This study examined the effect--on Mozgovoy (Al-sensitive) and Falenskiy 42 (Al-stable) peas; Dnepropetrovskaya (sensitive) and Moskovskaya (stable) corn; Odesskaya 9 (sensitive) and Polyarnay 14 (stable) barley; and Tulun (sensitive) and Lutescence 62 (stable) winter wheat--of $Al_2(SO_4)_3$ on the levels of organic acids (citric and malic) and "abscizoviy"[sic] acid in the roots and leaves of those plants. Changes in those levels, as a function of Al-ion sensitivity, are tabulated. The suggestion is made that changes occurring in these levels can be used to evaluate the tolerance of the plants to aluminum toxicity of soils. Figure 1; references 11: 6 Russian, 5 Western.
[567-8586]

USSR

UDC 633.17:595.752

CHANGE IN CONTENT OF CARBOHYDRATES AND NITROGENOUS SUBSTANCES IN SORGHUM PLANTS INJURED BY APHIDS

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 3-5 manuscript received 15 Nov 79

SUSIDKO, P. I., academician of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin and PISARENKO, V. P., candidate of biological sciences, All-Union Order of Labor's Red Banner Scientific Research Institute of Corn

[Abstract] This work has examined the effect--on the protein and carbohydrate composition of sorghum--of aphids feeding on the plants. The aphid attacks are an important negative biotic factor of the environment. Their action is described as a factor which disrupts the homeostasis of the structural-functional organization of the plant body; knowledge of their action

may help to find ways to render sorghum more resistant to aphid action. The present study, carried out 1976-1978, has assayed content of sugars, starch, nitrogen compounds and amylolytic enzyme action of the plant. Sorghum studied were hybrid forms of Sivashkiy 50 (Kuban amber and Sarvashi) and the hybrid itself. The aphids were *Shiraphis graminum* Rond. and *Rhopalosiphum maydis* Fitch. Results are tabulated of the levels of monosaccharides, saccharose, total sugar, starch, total nitrogen, protein N and non-protein in aphid-injured and aphid-free sorghum forms. Deviation from normal carbohydrate levels were seen in increase in simple sugars and decrease in starch in the injured plants; activities of alpha and beta-amylase rose substantially. Further, there occurred a decrease--in the damaged plants--in the levels of the nitrogenous substances assayed. It was noted that the increase in accumulation of mono-compounds of carbohydrates was the most substantial effect of the aphid injury. References 10: 9 Russian, 1 Western. [567-8586]

USSR

UDC 633.511:631.468

EFFECT OF VARIOUS FORMS OF NITROGEN FERTILIZERS ON THE VITALITY OF THE COTTON WILT CAUSATIVE AGENT *VERTICILLIUM DAHLIAE* IN THE SOIL

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 7-9 manuscript received 25 Sep 79

MUROMTSEV, G. S., academician VASKHNIL, and CHERNAYEVA, I. I., candidate of biological sciences, All-Union Scientific Research Institute of Agricultural Microbiology

[Abstract] The activity of oxidized and reduced forms of nitrogen fertilizers towards the phytopathogenic fungus *Verticillium Dahliae* (VD) and towards the microbiological processes occurring in the soil was investigated. The following compounds were tested as representatives of the nitrate and ammonia forms of nitrogen: NaNO_3 , NH_4NO_3 , $(\text{NH}_4)_2\text{HPO}_4$, $(\text{NH}_4)_3\text{PO}_4$, NH_4Cl and urea. The infectious germs increased in number when nitrates were used, but decreased in the presence of ammonia or urea nitrogen. The effect of ammonia and nitrates on the biological activity of the soil was different: the content of ethylene and CO_2 in the soil dropped with nitrates, and increased with ammonia. Different forms of nitrogen fertilizers may thus have an indirect effect on the phytopathogenic fungi through soil microflora, changing their composition and the physiological-biochemical properties of individual microorganisms. References 10: 7 Russian, 3 Western. [557-7813]

USSR

UDC 633.11"324":631.527

METHODS OF BREEDING A NEW VARIETY OF WINTER WHEAT IMMUNE TO STINKING SMUT

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 5-7 manuscript received 3 Sep 70

VARENITSA, YE. T., corresponding member VASKhNIL, Scientific Research Institute of Agriculture of the Central Regions of the Non-chernozem Zone

[Abstract] A new variety of winter wheat, Zarya, was developed by a complex method of gradual intraspecies hybridization. Three crossings (1953, 1960 and 1967) were performed with a selection of highly productive plants resistant to frost and immune to stinking smut. The new hybrid grain showed the desired properties exceeding the standard Mironovskaya 808, under both the experimental and production conditions. Zarya is a sturdy plant, it withstands winter conditions well. The plants have somewhat greater photosynthetic potential than the control. Recent tests showed that the fields of the winter wheat Zarya to be free of the stinking smut infections. Figure 1; no references.

[557-7813]

USSR

UDC 633.14<<324>>:631.524.86

TRENDS OF WINTER RYE SELECTION FOR RESISTANCE TO RUST

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 20-21

KOROLEVA, L. A., candidate of biological sciences, All-Union Scientific Research Institute of Phytopathology

[Abstract] The goal of rye selection for rust resistance has been to identify virulence genes of the rust pathogens. The first data of the racial composition of the stem rust pathogen in the USSR were acquired in differentiating barley varieties. Additional research has concentrated on the heterogeneity of the pathogen. Breeders must now select varieties possessing resistance to the maximal number of known pathogen races. To acquire resistant grains, relatively resistant varieties of rye Kupriyanov and Derzhavin are being used for hybridization. Phytopathologists examined about 1000 specimens in a controlled experiment over several years. Results showed that specific resistance appears in a variety of genotypes, for particular races or their groups. Several varieties (Krupnozernaya, Novozybkovskaya 4, Petka Moorroggen, Lisitsina) were resistant enough to serve as donors of resistance to stem rust. Interest has been shown in using certain old varieties

of cultured and wild rye as sources of resistance to rust diseases; Derzhavin had resistance to stem rust and isolates of brown rust, while Pervenets also possessed a high concentration of genotypes resistant to both types of rust. Among wild varieties, Kupriyanov was resistant to stem and brown rust. The next step is to identify genes of resistance corresponding to races of the pathogen in the resistant forms of winter rye. The resistant forms can be used before perfection of the resistant donors; initial selection of resistant plants is recommended.
[569-12152]

USSR

UDC 633.11:631.527.2:631.524.86

METHOD OF ACCELERATED EVALUATION OF WHEAT RESISTANCE TO SMUT

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 p 19

TISHKOVSKAYA, E. AN., junior scientific collaborator, Irkutsk Support Station of the All-Union Institute of Plant Protection

[Abstract] An accelerated method designed by V. K. Krivchenko, 1963 for evaluating smut resistance in wheat was used at the Irkutsk Support Station of the All-Union Institute of Plant Protection in recent years. Inoculation was performed by vacuum method. A variety with average susceptibility was infected with loose smut. The norm of inoculum was gradually increased from 1 g contagious matter per liter of water to 4 g. As a result of this increase, the amount of seeds infected rose from 3-4% to 13-18%. Degree of infection depended largely upon humidity and air temperature; optimal temperature was 18-24° and optimal humidity, 100% or close to 100%. In the experiment, air temperature was 25-34° and humidity 60-78%, dropping to 30% occasionally. Processing seed with chemical disinfectants influences infection; in the experiment, seeds were disinfected only in 1972, so this was not a factor in this case. Laboratory grown plants appeared to be afflicted less from the disease than those subjected to field conditions, so the number of samples were increased from 100 to 200. This increase resulted in an equalization between laboratory and field experiments. The results indicated that local weather conditions, especially air temperature and humidity, may distort experimental findings.
[569-12152]

USSR

UDC 633.1:631.524.86

PROBLEM OF SMUT RESISTANCE IN GRAIN CROPS AND MEANS TO ITS RESOLUTION

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 12-13

SHIROKOV, A. I., candidate of biological sciences, CHMUT, L. YA. and MASLENKOVA, L. I., Siberian Scientific Research Institute of Agriculture

[Abstract] From 1971 to 1978, 2860 varieties of wheat were tested for smut resistance in an experimental infection environment. A few of the varieties of soft spring wheat were resistant to kernel smut; there were a few more resistant forms among hard wheat varieties. The following soft spring wheat varieties showed resistance: K-45716, K-45717 (Czechoslovakia); K-44955 (Poland); K-45196, K-45200, K-45198 (Bulgaria); K-44408 (USA); K-45783 (Argentina); K-47794, K-45380, K-93066 (USSR); among hard wheat varieties from Italy and Chile. At the same time, researchers acquired a quantity of samples resistant to loose smut. This has provided a means to breed for resistance to this disease. Barley is infected by kernel, real and false loose smut. Mixed infection occurs. Virulence varies. Among local regional barley varieties, reliable donors of resistance were lacking. Presently, Ethiopian donors are being used to develop resistant varieties at the authors' Institute. A variety of oats, Omsk Kormovoy 1, is being developed, which possesses high resistance to smut diseases. In work with millet, progress has been made under the Institute leadership of N. M. Feduleva. In 1971-72, in experimental conditions, 1.5-2% resistant forms were achieved, but by 1977-78, 30-35% were resistant. Varieties of millet VNIS 29 and Saratov 2 possess high resistance and can produce new immune hybrids. The work of this Institute shows that grain crops resistant to smut diseases can be developed by means of breeders working in contact with phytopathologists. [569-12152]

USSR

UDC 633.11:632.4

ACTIVITY OF PROTEASE INHIBITORS AND WHEAT RESISTANCE TO COVERED SMUT

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 15 No 1, 1980 pp 143-144 manuscript received 17 Mar 78

YAMALEYEV, A. M., MUKHSINOV, V. KH., ISAYEV, R. F., YAMALEYEVA, A. A. and KRIVCHENKO, V. I., All-Union Scientific Research Institute of Plant Science imeni N. I. Vavilov, Leningrad; Bashkir Branch, USSR Academy of Sciences, Ufa

[Abstract] A number of *Triticum aestivum* and *T. durum* samples were investigated for levels of natural trypsin inhibitors in relation to their susceptibility to wheat smut. Results showed that the seeds of the more resistant

samples contained higher levels of the protease inhibitor than did the susceptible varieties and that, in general, the levels in soft wheat (*T. aestivum*) were higher than in hard wheat (*T. durum*) in accordance with the greater resistance of the former variety. The coefficient of correlation between resistance and trypsin inhibition was 0.77 ± 0.14 (significant at the 0.1% level). References 5: 1 Russian, 4 Western.
[570-12172]

USSR

UDC 636.4:636.082.43

PRODUCTIVITY OF BASIC SWINE STOCKS IN PURE-STRAIN BREEDING AND COMMERCIAL CROSSBREEDING UNDER CONDITIONS IN THE UKRAINE

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 22-24 manuscript received 3 Sep 79

MEDVEDEV, V. A., doctor of agricultural sciences, TKACHEV, A. F., YURCHENKO, V. N., KHVATOV, A. I., POLEGESHKO, I. S. and YATSUN, YA. YA., candidates of agricultural sciences, Scientific Research Order of Labor's Red Banner Institute of Livestock Breeding of the Forest Steppe and Polessie, UkrSSR

[Abstract] The authors' institute has been collecting data on the title subject; information on the period 1970 to 1978 are reported in this article. Basic pig stocks examined include [Russian language designations]: Krupnaya belaya; Mirgorodskaya; Landras; Uel'skaya; Kharkov breeds; Krupnaya belaya x Landras; Krupnaya belaya x Uel'skaya; and crossings of Krupnaya belaya with i) Landras x Uel'skaya, ii) Uel'skaya x Landras, iii) Dyurok, iv) Hampshire. The Krupnaya belaya was the most prolific, though not considerably. Milk suppliers were in the order of Krupnaya belaya, Landras, Uel'skaya, Mirgorodskaya and Kharkov swine. The Kharkov had the most piglet litters. Similar data (with respect to meat yield, fodder needs) are tabulated which show, essentially, an adequately high productivity in the Ukrainian locales. Rational breeding can be used to improve quantity and quality of commercial pigs. No references.
[567-8586]

USSR

UDC 619:614.9:614.48:636.083.1

DISINFECTION MEASURES ON INDUSTRIAL-TYPE PIG RAISING FARMS

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 17-20

DIDNITSKIY, I. A., All-Union Scientific Research Institute of Veterinary Sanitation

[Abstract] This is a lecture-type article. Disinfection measures on industrialized pig-raising farms are absolutely necessary and must be provided for even at the planning and design stage. They must be executed according to a plan, by veterinary specialists, with due attention to local epizootic problems, condition of the animals, availability of equipment and materials, types of disinfection facilities, timely performance of such

procedures as rinsing, aerosol spraying, application of agents and maintenance of equipment. Responsibility for execution of the disinfection plan rests with the farm director; its timely execution is the responsibility of his executives. Disinfection with the use of aerosols is described as a promising method. Agents mentioned include caustic soda, chloride of lime, formaldehyde, pulsed-spray hot or boiling water. Disinfection of transport vehicles, prophylactic cleansing of slaughterhouse quarters, and use of special clothing for quarantine procedures, are stressed.
[568-8586]

- END -

SELECTIVE LIST OF JPRS SERIAL REPORTS

USSR SERIAL REPORTS (GENERAL)

USSR REPORT: Agriculture
USSR REPORT: Economic Affairs
USSR REPORT: Construction and Equipment
USSR REPORT: Military Affairs
USSR REPORT: Political and Sociological Affairs
USSR REPORT: Energy
USSR REPORT: International Economic Relations
USSR REPORT: Consumer Goods and Domestic Trade
USSR REPORT: Human Resources
USSR REPORT: Transportation
USSR REPORT: Translations from KOMMUNIST*
USSR REPORT: PROBLEMS OF THE FAR EAST*
USSR REPORT: SOCIOLOGICAL STUDIES*
USSR REPORT: USA: ECONOMICS, POLITICS, IDEOLOGY*

USSR SERIAL REPORTS (SCIENTIFIC AND TECHNICAL)

USSR REPORT: Life Sciences: Biomedical and Behavioral Sciences
USSR REPORT: Life Sciences: Effects of Nonionizing Electromagnetic Radiation
USSR REPORT: Life Sciences: Agrotechnology and Food Resources
USSR REPORT: Chemistry
USSR REPORT: Cybernetics, Computers and Automation Technology
USSR REPORT: Electronics and Electrical Engineering
USSR REPORT: Engineering and Equipment
USSR REPORT: Earth Sciences
USSR REPORT: Space
USSR REPORT: Materials Science and Metallurgy
USSR REPORT: Physics and Mathematics
USSR REPORT: SPACE BIOLOGY AND AEROSPACE MEDICINE*

WORLDWIDE SERIAL REPORTS

WORLDWIDE REPORT: Environmental Quality
WORLDWIDE REPORT: Epidemiology
WORLDWIDE REPORT: Law of the Sea
WORLDWIDE REPORT: Nuclear Development and Proliferation
WORLDWIDE REPORT: Telecommunications Policy, Research and Development

*Cover-to-cover

JPRS 75688

13 May 1980

USSR Report

LIFE SCIENCES

AGROTECHNOLOGY AND FOOD RESOURCES

No. 3



FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

13 May 1980

USSR REPORT
LIFE SCIENCES
AGROTECHNOLOGY AND FOOD RESOURCES

No. 3

CONTENTS

AGROTECHNOLOGY

- Production of Various Fodder Mixes for Beef Cattle..... 1

ECOLOGY

- Condition of Fodder-Producing Lands in the Swampy Taiga Zone
of the West Siberian Natural Region..... 2

FOOD SUPPLY

- Automated System of Administration in Pedigree Breeding..... 3
Official Communications [On Animal Husbandry]..... 4

PHARMACOLOGY

- Pharmacological Evaluation of Androsage Septentriolus L..... 5

PLANT BIOCHEMISTRY

- Wild Essential-Oil Plants of Uzbekistan, Potentially Useful for
Food Industry..... 6
Tissue Culture of Ginseng. Communication I. Chemical
Composition of the Biomass of Ginseng Culture..... 7

VETERINARY MEDICINE

- Technique for Nonsurgical Transplantation of Large Horned
Cattle Embryos..... 8
Role and Tasks of Science..... 9

PRODUCTION OF VARIOUS FODDER MIXES FOR BEEF CATTLE

Moscow ZHIVOTNOVODSTVO in Russian No 2, 1980 pp 40-41

LEUSHIN, S. G., professor, doctor of agricultural sciences and PIVDVAROV, N. S., scientific collaborator, All-Union Scientific Research Institute of Beef Cattle Raising

[Abstract] Development of specialized sectors of beef cattle raising in grain producing regions has required maximal utilization of field by-products, and straw in particular. At the All-Union Scientific Research Institute of Beef Cattle Raising in Orenburgskaya Oblast, shops to house the feed reducer-mixer ISK-30 have been built and developed in Oblast enterprises. The apparatus, after structural modifications, is given to Oblast industry; it can be used in feed enterprises serving 3,000-5,000 head of cattle. It successfully reduces and mixes straw, hay, silage, watermelons and squashes. A distinctive feature of the apparatus is that the passage for fodder can be raised to provide access for repair and maintenance. Researchers had wanted the capability to form feed granules or briquets. A shop with this capability was built at the "Rossiya" kolkhoz in Ilekский Rayon. In summer, briquets were processed in press-briquetmaker OPK-2.0 from grass cuttings. In winter the shop produced briquets and granules with straw content 30-80%. The fodder was tested on 45 steers. One group received fodder of 17-19% straw, 55-57% silage, 6-7% grass flour, 1-1.5% chick-peas and 16-18% barley. Group three received silage and briquets of recipe I (50% straw, 15% grass flour, 15% wheat by-products, 15% barley and 5% chick-peas). Group two received silage and briquets of recipe II (70% straw, 15% grass flour, 10% barley, 5% chick-peas) for 62 days, and briquets of recipe I for 128 days, along with silage. Results showed that steers fed with recipe I and silage had 8.2% more body mass than a control group, and 3.0% more than steers fed corn silage and briquets of recipes II and then I. Figures 2.

[571-12,152]

ECOLOGY

UDC 636.085.3(571.1)

CONDITION OF FODDER-PRODUCING LANDS IN THE SWAMPY TAIGA ZONE OF THE WEST SIBERIAN NATURAL REGION

Leningrad RASTITEL'NYYE RESURSY in Russian No 1, 1980 pp 3-14 manuscript received 18 May 79

SAVCHENKO, I. V., All-Union Scientific Research Institute of Fodder imeni V. R. Vil'yams, Lugovoye, Moscow Oblast

[Abstract] The area of swampy taiga West Siberian natural region comprises 176,000,000 hectares. It contains six natural divisions. Forest and shrubs occupy 86,500,000 ha (49%), swampland, 41,200,000 ha (23.3%) and agricultural lands, 11,400,000 ha (6.4%). The area of fodder-producing lands in the region comprises 6,800,000 ha, deer pasture--25,500,000 ha. The area of fodder-producing land can be broken down into flatland and dry valleys, which are largely used as pasture, occupying 3,703,000 ha (54% of the area of all haying and pasture areas), low lying marshy and sunken lands, which are used mainly for hay fields, 431,000 ha; tidal lands--2,288,000 ha-- and swamp, 415,000 ha. Deer pasture in forest and shrub areas is 9,515,000 ha; lichen deer pasture, 15,992,000 ha. Considering the demand for animal production in this area, it will be necessary to increase the area of cultivated pasture. The annual yield of fodder is 5,917,400 to 10,160,000 tons dry mass, and from deer pastures, 1,465,000 tons. The meliorative work on hay fields has not been satisfactory, partly due to shrubs and hillocks, but the development of pasture lands for cattle has been successful. More than 27% of fodder-producing areas have acidic soils; in the south, saline and solentz soils are widespread. The primary goal in the Oblast for increased fodder production is to develop tidal meadows. Measures to allow quick drainage of flood waters are necessary. Mechanical removal of shrubs and trees is planned. Fertilizers and lime should be supplied. Figure 1 (a map); reference 1 (Russian). [572-12,152]

AUTOMATED SYSTEM OF ADMINISTRATION IN PEDIGREE BREEDING

Moscow ZHIVOTONOVOSTVO in Russian No 2, 1980 pp 19-20

PLUNGE, V. I., chief of agricultural computer center, Lithuanian Scientific Research Institute of Rural Electrification, candidate of economic sciences and RAMANAUSKENE, V. YU., Department Head

[Abstract] Efforts of the Lithuanian Scientific Research Institute of Rural Electrification and the Scientific Research Institute of Livestock Breeding, in association with breeding specialists, have brought about an automated administration system with a base of computers "Minsk-22" and "Minsk-32." The system has the characteristic feature of linear ties among all institutions with breeding operations in the republic. The tasks were to provide for accounting and operational analysis of milk production, adaptation of cows to machine milking, health and reproduction of the dairy herds; accounting and operational analysis of growth, development and meat qualities of young stock; formulation of expanded breeding records for administrative purposes; analysis of herd records; evaluation of dairy cattle for milk production by comparisons of 305 day and 90 day lactation periods; and evaluation of different sectors of the herds for various qualities. Data are collected and sent to the computer center monthly. The center then returns reports of the operational analysis of herd conditions and individual accounts of milk production. After each year, the system provides a summary of milk production for each cow; expanded accounts of breeding work, including appraisals of cows; and analyses of the herd genealogical structure. The automation has provided for decreased work in documentation, improved work of breeders, increased statistical abilities and improved planning ability and communications. Before the operation, 171,500 cows were appraised; with its introduction, 398,200 cows were appraised. As a result of the system, four new lines of black spotted Lithuanian stock were introduced. In 1978 for every 100 cows there were births of 31 heifers, each heifer having an average milk yield of 2981 kg milk with a 3.69% fat content, which was an increase of 1032 kg milk and .14% fat content over 1965. [571-12,152]

OFFICIAL COMMUNICATIONS [ON ANIMAL HUSBANDRY]

Moscow ZHIVOTONOVODSTVO in Russian No 2, 1980 p 11

No Author. Communications coordinated with the All-Union Central Trade Union Council and State Commission of Labor USSR; approved by a resolution of the colleagues of the Ministry of Agriculture USSR and presidium of the Central Committee, Trade Union of Agricultural Workers, 25 Dec 1979

[Abstract] This article concerns The All-Union Socialist Competition of Livestock Workers for Increase in Production and Preparation of Animal Products, Winter, 1979/80. Kolkhozes, sovkhoses, interindustry enterprises and other state agricultural enterprises and organizations which spent the winter working with livestock will be acknowledged as victors in the All-Union Socialist Competition of Livestock Workers for increase in production and preparation of animal products in winter, 1979/80. The winners will be those who achieved highest indicators in fulfillment of plans and socialist commitments in production and sale of meat, milk, eggs, wool and other products for the fourth quarter of 1979 and first half of 1980; and increase in production and purchase of animal products, conservation of the cattle and poultry population, effective use of feeds and increase of cultures in production. Materials for summing up the competition and proposals of awards will be distributed to kolkhozes and other organizations before 7 July 1980 by Ministries of Agriculture of the union republics, Ministry of Sovkhoses Ukrainian SSR, Council of Kolkhozes Moldavian SSR, and republic trade union committees in the Ministry of Agriculture USSR. Honorary certificates from the CC CPSU, Council of Ministers USSR, All-Union Central Trade Union Council and Central Committee, All-Union Lenin Young Communist League will be awarded. Distribution of money awards to individuals may be up to 70% of the total; the remainder is to be used for cultural and recreational measures.

[571-12,152]

PHARMACOLOGY

UDC 633.88:582.918.3:61

PHARMACOLOGICAL EVALUATION OF ANDROSACE SEPTENTRIONALIS L.

Leningrad RASTITEL'NIYE RESURSY in Russian No 1, 1980 pp 129-134 manuscript received 22 Jan 79

PIROZHKOVA, N. M., KRASHOV, YE. A., KOVAYEV, V. B., VASIL'YEV, N. V. and GORSHKOVA, V. K., Tomsk Medical Institute; Tomsk Scientific Research Institute of Biology and Biophysics, Tomsk State University; All-Union Scientific Research Institute of Nature Conservation and Park Management of the USSR Ministry of Agriculture, Moscow

[Abstract] Androsace septentrionalis L. has received interest due to its distribution and medicinal qualities. Biological activity of extracts of quantities of saponins (3-3.2%) were examined in plants collected in June of 1975-76 in rayons of Gorniy Altay and southern Krasnoyarskiy Kray. The presence of two triterpene aglycones with R_f 0.58 and 0.89 in system 3 were noted; sugar components were identified with D-glucose, D-galactose, L-arabinose and L-rhamnose (R_f 0.21, 0.30, 0.34 and 0.70 in system 4 respectively). The triterpene glycosides had an inhibiting effect on an early culture of gonococcus Neisseria gonorrhoeae. The anticonvulsive activity of liquid extracts was tested in mice; for comparison, five Siberian species of Androsace were included in the experiment. Antispasmodic effects were evident with a dose of 0.05 ml/10g mass using A. septentrionalis in maximal electroshock testing. A weaker antispasmodic effect was achieved with A. bungeana. An extract of combined saponins from A. septentrionalis L. exhibited a weak antispasmodic effect. References 34: 20 Russian, 1 Ukrainian, 13 Western. [572-12,152]

WILD ESSENTIAL-OIL PLANTS OF UZBEKISTAN, POTENTIALLY USEFUL FOR THE FOOD INDUSTRY

Leningrad RASTITEL'NYYE RESURSY in Russian No 1, 1980 pp 104-107 manuscript received 7 Dec 77

KHODZHIMATOV, K. KH., and RAMAZANOVA, N. KH., Institute of Botany, Uzbek SSR Academy of Sciences, Tashkent

[Abstract] Since 1967, the natural flora of the republic has been examined in the Institute of Botany, Uzbek SSR Academy of Sciences to locate essential-oil and spice aromatic plants which would be useful in food industries. Plants were tested at the Tashkent experimental plot. Notable plants from the flora of Uzbekistan were 560 species of essential-oil plants from 233 genera and 52 families. The most promising for use were the following species: balm Melissa officinalis L., the oil of which is useful for non-alcoholic drinks, Origanum tytthanthum Gontsch, also desirable for non-alcoholic drinks, Salvia sclarea L. and S. bucharica (the former could be used in the liquor-vodka and confectionery industries). Ziziphora pedicellata Pazij et Vved. was used in a new non-alcoholic drink "Tashkentskiy." Ziziphora brevicalyx Juz. and Ziziphora pamiralaica can be used in ways similar to Ziziphora pedicellata. Bunium persicum was recommended for use in sausage preparation, meat and fish canning, fish pickling and in recipes of bitter infusions like balsam. Muretia fragrantissima and M. transitoria, used locally as a condiment, are also of interest. Hypericum perforatum L. has been used in the liquor-vodka industry for vermouthe and nastoyka. It is recommended for new tonic drinks. The test plants of these species yielded a better harvest than did those in the wild: Melissa officinalis L., Origanum tytthanthum, Ziziphora pedicellata and Bunium persicum. These four are particularly recommended for cultivation. References 11 (Russian). [572-12,152]

TISSUE CULTURE OF GINSENG. COMMUNICATION I. CHEMICAL COMPOSITION OF THE BIOMASS OF GINSENG CULTURE

Leningrad RASTITEL'NIYE RESURSY in Russian No 1, 1980 pp 123-129 manuscript received 11 Jul 79

VYSOTSKAYA, R. I., and SLEPYAN, L. I., Leningrad Chemico-Pharmaceutical Institute

[Abstract] Chemical, histochemical and microscopic analyses of Penax ginseng C. A. Mey. were undertaken at the Leningrad Institute. A general chemical analysis of the root itself was compared to that of the biomass. A preliminary phytochemical analysis of the tissue culture biomass indicated the presence of triterpene saponins. Other secondary products of metabolism were not demonstrated. Water extracts of the biomass gave a negative result in hemolytic testing. Content of total glycoside fraction was 5.92 ± 0.87 in biomass of tissue culture, and no less than the root. Using the ultramicro thin-layer chromatography, it was shown that the biomass of tissue culture contained glycosides with values analogous to panaxosides of the ginseng root. Results of the general chemical analysis showed that ash content in biomass was more than twice the amount for the roots. The carbohydrate fraction of biomass contained sucrose and fructose. Qualitative and microchemical analysis indicated that a characteristic reaction of the biomass was with a saturated solution of $SbCl_3$ in glacial acetic acid; histochemically the typical rosy-lilac color from this reaction was localized in the cell cytoplasm, just as is the case for the intact. Microscopic examination of biomass powder also showed similarities to root powder.
[572-12,152]

UDC 636.22/.28:612.64.02

TECHNIQUE FOR NONSURGICAL TRANSPLANTATION OF LARGE HORNED CATTLE EMBRYOS

Moscow ZHIVOTNOVODSTVO in Russian No 2, 1980 pp 50-54

PROKOF'YEV, M. I., candidate of agricultural sciences, BELEVICH, V. P., RYABYKH, V. P., BAKHITOV, K. I., CHERNYKH, V. YA., GORYACHEV, V. S., MALENKO, G. P., NIKITINA, V. N., candidates of biological sciences, DRONIN, A. P., Junior Scientific Collaborator and KORETSKAYA, L. I., Senior Laboratory Worker, All-Union Scientific Research Institute of Physiology, Biochemistry and Nutrition of Agricultural Animals, Borovsk

[Abstract] A technique for nonsurgical transplantation of embryos was developed by the authors at the experiment station "Kamenka" of Moskovskaya Oblast. It includes superovulation in donor cows; extraction of the embryo; manipulations with embryos from outside the body; evaluation of their quality; and transplantation. Two superovulation induction methods are described: a one time dose of synthetic fatty acid 2500-3000 iu on the 16th day of the sexual cycle, or FSH, 40-50 mg twice daily for five days, or the same substances introduced on the 10th day in the cycle with injections of prostaglandin F_{2a}. In the embryo extraction, a single canal catheter is used, consisting of a hard tube of nonrusting steel and a flexible tip of polyethylene or polyvinyl chloride. The catheter is inserted through the cervix with the aid of a stilet. A physiological medium (20-40 ml solution) is injected which washes out the embryonic cells, mucus and epithelium. The fluid flows out through the catheter into a collector situated radially; the flushing action of additional quantities of fluid is repeated 5-8 times with 20-30 second intervals. The cells are then located under MBS-2 or MBS-9 microscopes and are evaluated. Embryos 10 days old had a better survival rate than those 8 days old. The transplantation is accomplished by insertion of a catheter into the uterine horn, 5-7 cm from the body. Thus the procedure approached artificial insemination in simplicity; in this instance, more than 200 embryos of large horned cattle were transplanted. Results showed a survival rate of up to 50%. Figures 5.
[571-12,152]

ROLE AND TASKS OF SCIENCE

Moscow ZHIVOTNOVODSTVO in Russian No 2, 1980 pp 15-17

VAGONIS, Z. I., professor, director, Lithuanian Scientific Research Institute of Livestock Breeding

[Abstract] Increased demands for animal production have brought urgent requirements on scientists and producers for intensification of their efforts. Creation of a strong fodder base, improved breeding, systematized work and increased application of veterinary research are necessary. Methodological supervision of animal breeding has been accomplished in the republic by the author's institute, which works closely with other scientific institutions. A so-called "baysogal'skaya" [probably derived from the Baysogal'skiy Experimental Farm] technology of freezing and handling bull sire sperm has been successfully utilized, increasing amounts available. The quality of sperm has also been improved. To verify parentage records, researchers organized an analysis of blood groups. In 1972, a republic self-supporting laboratory was created to research animal blood groups; it incorporated immunogenetic and genetic methods in breeding operations. The laboratory has provided more information about populations and also results of genetic improvements. In order to avoid inheritance of harmful genes, cytogenetic verification of animals used for artificial insemination has been introduced. To evaluate swine breeding, selection indexes are used. Researchers have also designed indexes for cattle. Influence of environment is also considered in the genetic evaluation. Adaptation to mechanized milking and commercial enterprises is sought in breeding. Hopes are placed on methods of transplanting zygotes, bringing about superovulation, and preservation of zygotes and oocytes. A method of selection in five closed populations is being used with Lithuanian white swine. Four different selection programs are being utilized. The scientific base of breeding plays a large role in developing useful animals. Particular attention is paid to improved cattle breeding in large enterprises with the goal of acquiring animals with strong constitutions. [571-12,152]

- END -